

to the height of the capillary pressure, any factor which will raise the capillary pressure will favor the increased flow of lymph. Further, we know that the peripheral venous pressure varies from 5 to 15 millimeters of mercury and that the arteriole pressure ranges from 40 to 50 millimeters of mercury. A pressure, then, which will compress the venules, that is more than 15 millimeters of mercury, and will partially compress the arterioles, meets our requirement. A dressing at a pressure of 30 millimeters of mercury has been very satisfactory in our experience." This pressure may be accomplished and determined by the use of a rubber ⁴ balloon bag and the blood pressure manometer, respectively.

Atraumatic cutting of the graft and perfect and continuous immobilization should be employed in all skin grafts. The full thickness skin grafts should in addition have a pressure of 30 millimeters. These are based upon scientific principles, and are essential to success.

JOHN HOMER WOOLSEY.

INDUSTRIAL MEDICINE

ORGANIZED medical service in industry is essentially a product of the last two decades in the field of industrial management, and it promises greater development in the future than it has had in the past. Yet there is enough evidence at hand to justify the statement that the industrial physician is playing an important part in American industry.

The functions of medical departments in industry as related in the report of the National Industrial Conference Board¹ are preventive and curative, and include:

Physical examinations of applicants for employment and of workers returning to employment after illness.

Periodic re-examination of workers in hazardous occupations.

Treatment and redressing of injuries.

Diagnosis and treatment of minor medical disturbances as well as advice on medical problems.

Sanitation of workshops and maintenance of proper working conditions.

Health education and accident prevention.

In the smaller plants treatment of injuries is often the only work done by the plant physician, especially if he devotes only part time to industrial work or only visits if called. In larger plants practically all of the activities mentioned above will be found as the work of the medical department, and each item really belongs in any well-developed medical service.

Nurses play a rather prominent part in the work of medical departments. In the larger groups they are important aids to the physician, while in the small organizations, they represent the backbone of the department.

The physical examination of applicants is coming to be a common feature of employment management and, with the understanding of the purpose involved, opposition on the part of workers is disappearing. The object of these examinations is not to exclude persons with defects, but rather to mini-

mize sickness and accident risk by occupational selection.

A survey of 501 plants showed that over half made examinations occupying from ten to fifteen minutes and that the percentage of rejections was very small. Fewer injuries occurred in plants where examinations were made, but medical disorders were recorded in greater frequency, probably because of better medical work rather than a greater prevalence of disease.

Treatment of minor medical disorders seemed especially desirable in enabling the sick or injured worker to continue at his occupation and in preventing infections and serious types of illness. Plants should be equipped with proper facilities for diagnosis. If diagnosis reveals the necessity of prolonged treatment, the patient is generally referred to his private physician. In remote places both diagnosis and treatment are done at the plant.

Good health is an asset of the worker. The employer has a direct responsibility in seeing that this asset does not suffer impairment through adverse working conditions. Some plants also supplement this care by the use of health education and personal hygiene, which tends to better conditions outside of work.

The cost of medical service in industry has risen from an average of \$4.43 per employee in 1920 to \$5.14 per employee in 1924. The average annual expenditure for medical service was \$1.03 for each \$1000 of goods produced and \$3.62 for each \$1000 paid out for wages.

Medical service in industry has demonstrated its worth by protecting the worker from accident and disease, by health conservation, by adding to the productiveness of industry and by lessening the amount spent for public charity or for private relief, which in a number of cases would not come to the attention of a physician. Industrial medicine is already widespread, but its full influence on industry and the community is still to be measured.

C. O. SAPPINGTON.

ORTHOPEDICS

EMERGING from the subcutaneous stage with the discoveries of Lister, the surgery of deformities entered the period of open operation *pari passu* with other branches of surgical procedure.

Daily wrestling with the mechanical problems affecting the motor mechanisms of crippled human bodies through intervening years brought the devotees of bone and joint surgery up to 1914 with a fund of special knowledge which proved invaluable in dealing with the skeletal wreckage of war.

So great and so urgent was the need for the application of orthopedic principles in war surgery, that those already recognized as specialists in this branch of practice were altogether inadequate to meet the demand. Groups of picked men, usually chosen for a degree of proficiency in general surgery, were trained as rapidly as possible by high pressure methods of instruction in the principles of orthopedic surgery under military routine. Thus, at once, was the spur of a great need applied to the older special

⁴ Smith, F.: Pressure Bags for Skin Grafting, Surg., Gynec. and Obst., 1926, XLIII, 99.

¹ Medical Care of Industrial Workers, National Industrial Conference Board, 1926, p. 112.

group and a strong infusion of new blood administered.

When the war was over it seemed, for a time, that the identity of orthopedic surgery, as a specialty, might be lost through the very wide dissemination of the principles of its practice. (For a fine appreciation of his own specialty and a generous acknowledgment of its debt to general surgery, let the interested reader go back to "The Orthopedic Outlook" by Lieutenant-Colonel R. B. Osgood, *The Journal of Orthopedic Surgery*, Vol. I, No. 1, January, 1919.)

It soon became clear that there was nothing to fear for the identity of the specialty. A certain more than average fund of patience in the tedious striving for functional results and an inherent affinity for, if not aptitude in dealing with mechanical problems soon separated those who were to live and die orthopedic surgeons with general surgical experience from those who were destined to do likewise as general surgeons with orthopedic training. The result has been a broader and more sympathetic understanding among surgeons, an increasingly better service to suffering humanity and a strong and sustained advance in recreative and reconstructive surgery.

Great strides have been made in the knowledge and treatment of such conditions as congenital dislocations of the hip, scoliosis, infantile paralysis, tuberculosis of bone, the arthritides, fractures, bone-grafting, postural defects, and literally scores of lesser problems presented by crippled humanity.

The literature has kept pace with the advances of practice. The reader who is interested in a resumé of important advances is commended to the little book by A. H. Tubby¹ for a concise resumé of important developments during the preceding decade. As an extended critical review of the current literature, "The Reports of Progress in Orthopedic Surgery," compiled and edited by a group of Boston surgeons, led by Osgood and published from time to time in the *Archives of Surgery*, is invaluable.

The specialty of orthopedic surgery has emerged from the narrow confines and relative isolation of its earlier years. Teaching of the principles of orthopedics is an established part of medical education. Those who have made this specialty their acknowledged field of life endeavor have come to realize that any qualified surgeon who carries out orthopedic procedures according to the best standards of modern knowledge and technique does honor to the cause, whether or not he chooses to call himself an orthopedic surgeon.

Orthopedic surgery has become a great reconstructive branch of special surgical practice, and its devotees have taken their place as master mechanics in the noble guild of healing arts and practices.

E. W. CLEARY.

PROCTOLOGY

PROCTOLOGY, let it be said, has gradually separated itself from the realm of general surgery. The reasons for this are several: the increasing knowledge of pathological processes; refinements in diagnosis and treatment; introduction and use of more accurate and specialized instruments used as accessories and the reaction to exploitation of this subject by insufficiently trained individuals. Specialization tends to develop in accordance with physiological body units, thus the large bowel with its peculiar manifestations of disease has also become the object of special attention; indeed, proctologists have for this reason invaded an area beyond the original meaning of the term.

By digital examination alone 25 per cent¹ of rectal cancers should be discovered since as many start within reach of the examining finger, and the greater number of the remaining 75 per cent which start at recto-sigmoid junction may be observed through the sigmoidoscope. But mere examination does not suffice to establish a diagnosis, and the proctologist himself may be warned of difficulties not to be overcome by the more mechanical part of his practice.

Following the examples set in the past by the Allinghams, Sir Charles Ball, Harrison Cripps, Tuttle, Bardenheuer and Kraske, others, such as Ernest Miles, Lockhart Mummery, Bensaude, Quénu and Coffey, to mention only a few, have made real contributions to surgery of the large bowel. Through them the "Kraske" operation for rectal cancer is in desuetude, while the most radical of all² that of Ernest Miles, is either being standardized or, at least, its principles are being widely and practically accepted. In this disease, also, radium and x-rays have had their proponents and later still colloidal salts of the heavy metals have come into use as adjuncts to operation or as the sole means of hope in inoperable cases. Still under consideration, with prospects of hearing fruitful results, is the lead treatment³ experiments on which began under the auspices of Blair Bell of Liverpool. Pathologists more than suggest that all adenomata of the rectum may degenerate into malignant growths, and a multiplicity of these calls for resection of the colon.⁴

Cancer of the rectum with chronic ulcerative colitis are the two most important diseases the proctologist has to diagnose and treat. They are both mainly surgical and the results depend on early diagnosis. Diverticulitis is much more common than has been previously supposed, and at times surgical treatment is not only correct but urgent. While putting the graver diseases forward one does not forget more common conditions which are inclined to obscure the former, nor the fact that some of these conditions are prevalent in children, such as

1. Woolf, M. S.: *Calif. and Western Med.*, 1924, pp. 612-616.

2. Miles, W. Ernest: *Surgical Treatment of Cancer of the Rectum*, *Brit. M. J.*, 1920, 11.

3. The Nature of Malignant Neoplasia and Treatment of the Disease with Lead, *Brit. M. J.*, 2:919-938 (Nov. 20), 1926.

4. Dukes, S.: Relation of Simple to Malignant Tumors of the Large Intestine, *Proc. Roy. Soc. Med. (Proctol. Sub-Sect.)*, 1926, January. Idem, in *Brit. J. Surg.*, 1926, XIII, April.

¹ The Advances of Orthopedic Surgery. McMillan Company, 1925.